1.6.5 Embodied Energy of Other Roof Assemblies in the U.S.

	R-Value	Embodied Energy (MMBtu/SF) (1)	CO2 Equivalent Emissions (lbs/SF)
Concrete Flat Plate Slab (3)			
with EPDM membrane	41.94	0.30	47.55
with PVC membrane	41.94	0.27	44.34
with Modified bitumen membrane	41.94	0.25	42.29
with 4-Ply built-up roofing	42.27	0.91	93.17
with Steel Roofing	42.55	0.26	44.44
Precast Double-T (3)			
with EPDM membrane	40.74	0.18	23.78
with PVC membrane	40.74	0.15	20.57
with Modified bitumen membrane	40.74	0.13	18.52
with 4-Ply built-up roofing	41.07	0.80	69.39
with Steel Roofing	41.35	0.15	20.66
Open-Web Steel Joist (4)			
with Steel decking and EPDM membrane	41.55	0.19	20.29
with Steel decking and modified Bitumen membrane	41.55	0.14	15.03
with Steel decking and 4-ply built-up roofing	41.88	0.81	65.90
with Wood decking and modified bitumen membrane	40.68	0.14	11.89
with Wood decking and 4-ply built-up roofing	41.01	0.80	62.77

Note(s): Assumptions: 60 year building lifetime. Low rise building. Values are general estimations for the U.S. 1) Embodied Energy: Energy use includes extraction, processing, transportation, construction, and disposal of each material. 2) Resource Use: The weight of raw materials used in extraction, processing, transportation, construction and disposal of each material. 3) Includes membrane, 8" rigid insulation, vapor barrier, and latex paint. 4) Includes membrane, 8" rigid insulation, vapor barrier, gypsum board, and latex paint.

Source(s): Athena Institute, Athena EcoCalculator for Assemblies v.2.3. 2007, Available at www.athenasmi.org/tools/ecoCalculator/index.html